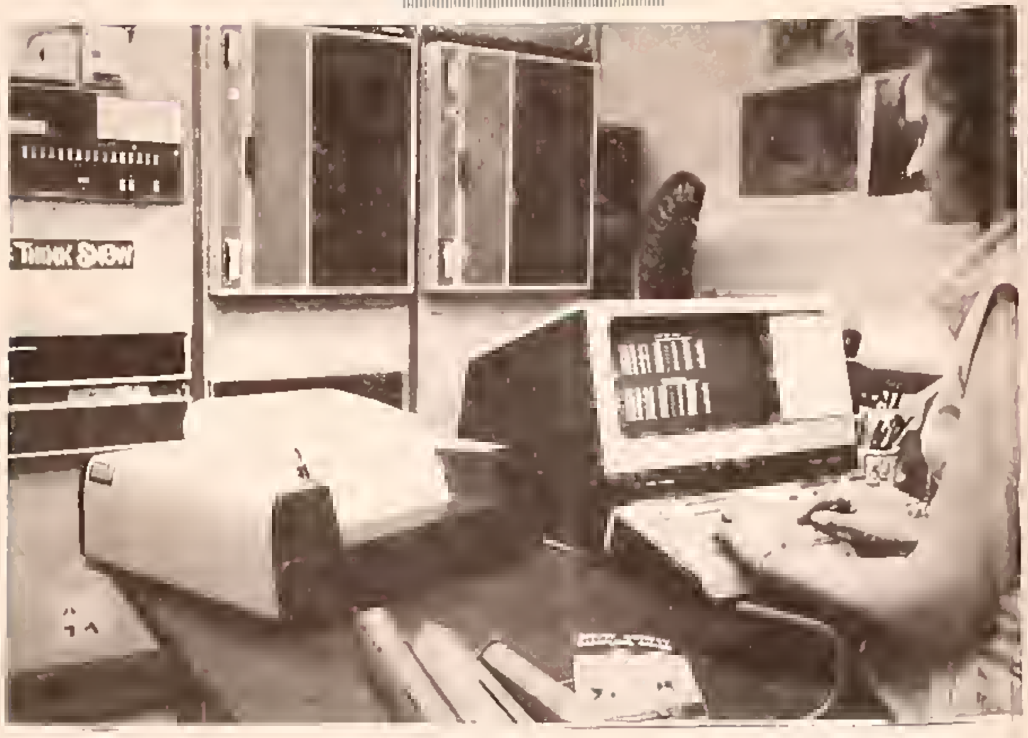
U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
Collaborating with
MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF
JAN. 1, 1980



Issued by
NORMAN A. BERG
ADMINISTRATOR
SOIL CONSERVATION SERVICE
WASHINGTON, D C

Released by
VAN K HADERLIE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE
Bozeman, Montana

In Cooperation with
J. A. ASLESON
DIRECTOR
Montana Agricultural Experiment Station

Report prepared by

PHILLIP E FARNES, SNOW SURVEY SUPERVISOR
DONALD J. HUFFMAN, HYDROLOGIST
CINDY L. ONDRAK, STATISTICAL ASSISTANT
GLENN J. HERDINA, HYDROLOGIC TECHNICIAN

SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

PUBLIC MEETINGS

Several possible alternatives for managing the Snow Survey and Water Supply Forecast Program were proposed at two workshops in December.

The alternatives were proposed by over 40 participants at the Missoula and Helena sessions; the participants then had an opportunity to evaluate the proposals.

Burl Winchester, a communications expert, conducted the sessions and will be summarizing the recommendations from the meetings. His summary will be mailed to you soon for further comment.

The two workshops were the start of a review which the U. S. Department of Agriculture initiated. The department will be selecting alternatives this Fall for managing and financing the Snow Survey Program. Without your comments and recommendations -- either at the meetings or by letter -- Montanan concerns will not be heard.

When you get the workshop summary, take a few minutes to reflect on the results and let us know your feelings.

FEDERAL STATE PRIVATE
COOPERATIVE SNOW SURVEYS
Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro electric power generation, navigation, mining and industry
"The Conservation of Water begins with the Snow Survey"

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P.O. Box 98
Bozeman, Montana 59715

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF
AGRICULTURE
AGR 101

U.S. MAIL

FIRST CLASS MAIL

STREAMFLOW FORECASTS

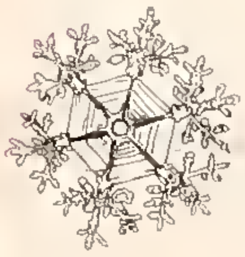
Based on current snowpack and soil moisture conditions, all streams in Montana are expected to have below average runoff this spring and summer. Most drainages are forecast to be 60 to 70 percent of average. The Missouri River drainage is expected to produce only half of its average spring runoff. Conditions are better in northwestern Montana where runoff is forecast in the 75 to 90 percent range. Snowfall during the next two months will have a significant effect on prospective water supplies.

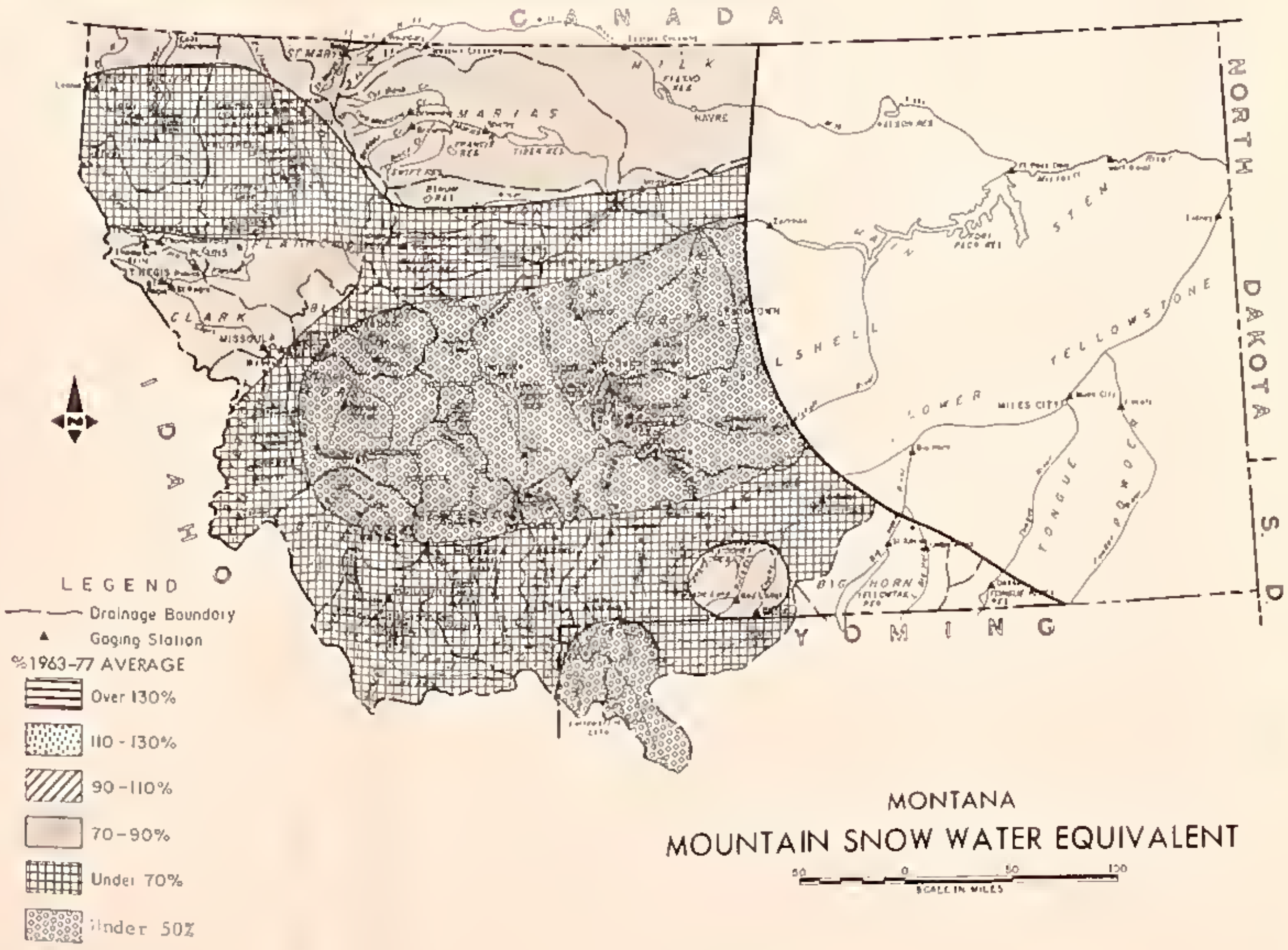
MOUNTAIN SNOWPACK

All areas in Montana have below average amounts of water stored in the snowpack. Most mountain watersheds have received below average precipitation since August and have had little snow accumulation prior to December.

The lowest snowpack, between 30 and 50 percent of average, covers most of Yellowstone Park and most areas in west-central and central Montana. The deepest snowpack areas in the state include the northern portions of the Flathead and Kootenai drainages and the lower Clark Fork drainage, west of the divide. East of the divide, the area between the Teton River and the Canadian border and a portion of the Beartooth Mountains near Red Lodge are also high. These areas are between 70 and 90 percent of average. All other watersheds have snowpacks between 50 and 70 percent of average.

Generally, soils under the snowpack are drier than normal. Snowfall during the next two months will be critical and will determine whether Montana will face a water shortage or whether runoff will be adequate for most uses.





MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

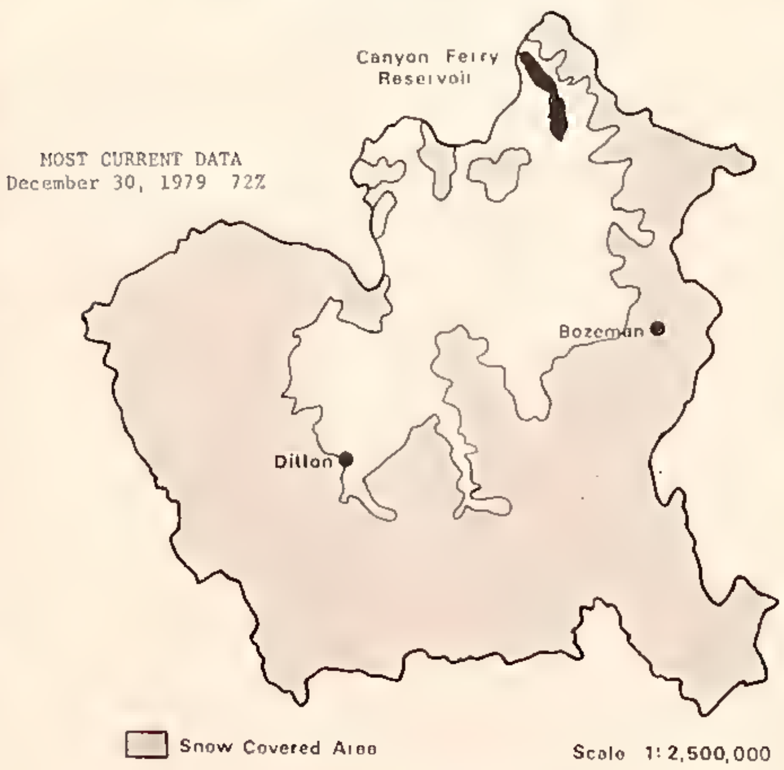
SNOW SURVEY DATA

SNOW

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR Date of Survey	THIS YEAR Snow Depth (Inches)	THIS YEAR Water Content (Inches)	PAST RECORD Water Content (Inches) Last Year	PAST RECORD Water Content (Inches) Average
ARCH FALLS	7350	12/31	17	4.0	5.4	5.9
BADGER PASS	6900	12/27	52	16.5	19.5	21.2
BANFIELD MOUNTAIN	5600	12/26	30	6.9	-	11.6
BANFIELD MOUNTAIN PILLOW	5600	1/01	SP	7.1	6.6	9.7
BASIN CREEK	7180	12/26	10	1.0	3.2	-
BEAGLE SPRINGS PILLOW	8850	12/31	SP	2.5	3.4	-
BEAR PAW SKI AREA	5200	12/28	4	1.4	7.0	2.6
BIG COULEE	5100	12/29	0	.0	4.1	2.9
BIG SKY	7700	1/02	23	5.0	5.0	7.0
BIG SPRINGS (ID)	6500	1/02	21	3.9	7.6	7.8
BLACK BEAR	7950	12/27	41	10.2	14.4	17.3
BLACK BEAR PILLOW	7590	12/27	SP	9.4	13.9	16.4
BLACK PINE	7100	12/28	11	2.2	6.2	5.2
BLACK PINE PILLOW	7100	12/28	SP	3.0	6.4	6.4
BLOODY DICK PILLOW	7600	12/31	SP	2.9	5.7	-
BLUE LAKE	5900	12/29	21	4.5A	10.0	10.6
BOULDER MOUNTAIN PILLOW	7950	12/31	SP	7.2	9.4	-
BOX CANYON PILLOW	6670	12/31	SP	3.2	4.4	-
BOXELDER CREEK	5100	12/28	11	3.4	-	3.8
BRIDGER BOWL	7250	12/27	22	4.8	14.6	13.1
BRIDGER BOWL PILLOW	7250	12/27	SP	5.1	12.7	12.3
BULL MOUNTAIN	6600	1/02	5	1.0	4.8	2.6
CALVERT CREEK PILLOW	6450	12/31	SP	1.5	3.8	6.0
CAMP CREEK (ID)	6800	12/31	14	2.2	3.2	4.8
CANYON (WY)	7750	12/31	21	3.0	8.4	6.5
CARROT BASIN	9000	12/26	48	11.2	11.6	16.6
CARROT BASIN PILLOW	9000	12/26	SP	9.0	-	12.2
CHESSMAN RESERVOIR	6200	12/27	2	.4	4.4	1.4
COLE CREEK	7850	12/31	27	6.4	12.8	8.5
COLE CREEK PILLOW	7850	12/31	SP	5.6	10.6	8.5
COMBINATION	5600	12/28	4	.6	3.5	2.5
COMBINATION PILLOW	5600	12/28	SP	1.0	3.4	2.8
COPPER BOTTOM PILLOW	5200	12/31	SP	2.6	6.9	7.4
COPPER CAMP PILLOW	6950	12/31	SP	11.9	16.0	19.6
COYOTE HILL	4200	1/03	14	3.1	5.9	4.0
CRYSTAL LAKE PILLOW	6100	12/31	SP	4.0	8.5	-
DAISY PEAK	7600	12/26	12	2.0	7.3	-
DALY CREEK	5780	12/27	14	3.1	6.5	5.2
DEADMAN CREEK	6450	12/26	13	2.6	6.6	5.6
DEADMAN CREEK PILLOW	6450	12/26	SP	2.3	6.3	5.2
DESERT MOUNTAIN	5600	12/27	17	3.4	6.0	7.0
DEVILS SLIDE	8100	12/31	27	6.8	9.4	10.5
DISCOVERY BASIN	7050	12/27	12	2.0	4.8	6.0
DIVIDE PILLOW	7800	12/31	SP	3.0	3.7	4.6
DIX HILL	6400	12/30	9	1.8	6.5	5.1
EMERY CREEK	4350	12/27	15	2.7	6.6	7.2
EMERY CREEK PILLOW	4350	12/27	SP	3.6	6.1	-
FISH CREEK	8000	12/28	17	1.0	3.0	-
FISHER CREEK	9100	12/31	EST	11.0	17.5	17.7
FISHER CREEK PILLOW	9100	12/31	SP	10.7	16.2	16.4
FLATTOP MOUNTAIN PILLOW	6300	12/31	SP	18.1	17.4	22.2
FLEECER RIDGE	7500	1/02	11	1.8	5.3	5.1
FOURTH OF JULY	5450	12/28	6	1.9	4.8	-
FRIDAY HILL	4620	12/28	23	6.2	6.6	-
FROHNER MEADOWS	6480	12/27	9	1.7	6.8	4.1
FROHNER MEADOWS PILLOW	6480	12/27	SP	2.4	5.1	4.3
GARVER CREEK	4250	12/26	12	2.9	-	5.9
GARVER CREEK PILLOW	4250	1/01	SP	5.1	4.0	5.0
GIBBONS PASS	7100	12/26	26	5.6	8.9	9.1
GRAVE CREEK	4300	12/26	16	3.8	7.0	9.0
GRAVE CREEK PILLOW	4300	12/26	SP	5.6	5.5	8.6
GRIZZLY PEAK	8400	12/31	26	6.1	12.2	8.2
HAND CREEK	5030	12/27	21	3.9	-	-
HAND CREEK PILLOW	5030	12/27	SP	4.0	6.9	-
HAWKINS LAKE	6450	12/26	46	13.2	-	14.6
HAWKINS LAKE PILLOW	6450	12/26	SP	11.0	-	14.1
HEART LAKE TRAIL	4800	12/26	27	6.3	12.2	6.6
HEBGEN DAM	6550	12/26	17	2.6	3.6	5.0
HELL ROARING DIVIDE	5770	12/28	35	9.4	11.0	14.5
HIGHWOOD DIVIDE	5650	12/28	0	.0	4.2	4.8
HIGHWOOD STATION	4600	12/28	0	.0	3.5	2.3
HOLBROOK	4530	12/29	13	2.5A	5.5	4.2
HOOD MEADOW	6600	12/31	17	3.6	5.2	5.5
HOODOO BASIN	6000	12/26	64	18.8	20.2	22.3
HOODOO BASIN PILLOW	6000	12/31	SP	15.9	18.2	20.6
HOODOO CREEK	5900	12/26	55	14.8	17.9	18.8
ISLAND PARK (ID)	6310	1/02	20	4.0	6.5	6.2
JOHNSON PARK	6450	12/26	6	.6	4.6	-
KILGORE (ID)	6200	12/29	16	2.6	3.0	4.5
KINGS HILL	7500	12/26	15	3.2	7.4	7.5
KIWANIS CAMP	3720	12/28	0	.0	3.4	.8
LAKE CAMP (WY)	21010	1/01	11	1.5	5.3	3.6
LAKE CREEK	6100	12/26	15	2.5	4.0	4.4
LAKEVIEW CANYON	6930	12/28	16	2.9	3.8	5.4
LAKEVIEW RIDGE	7400	12/28	13	2.2	3.6	5.0
LEMHI RIDGE PILLOW	8100	12/31	SP	2.4	5.9	4.9
LICK CREEK	6860	12/31	18	3.9	5.4	4.3
LICK CREEK PILLOW	6860	12/31	SP	3.0	4.6	4.4
LOLO PASS (ID)	5230	12/27	34	8.8	14.8	11.7
[illegible] MOUNTAIN	6800	12/30	29	7.8	8.6	10.5
LOOKOUT (ID)	5250	12/31	36	10.4	11.2	15.7
LOST HORSE	5940	12/28	32	8.2	16.5	13.8
LUBRECHT FLUME	4200	12/26	6	1.1	5.0	2.4
LUBRECHT FLUME PILLOW	5450	12/26	SP	1.0	4.3	2.2
LUBRECHT FOREST # 3	5450	12/26	7	1.1	5.0	2.9
LUBRECHT FOREST # 4	4650	12/26	4	.7	3.0	1.5
LUBRECHT FOREST # 6	4040	12/26	4	.6	3.1	1.5
LUBRECHT HYDROPLOT	4200	12/26	6	.8	4.0	2.8
MADISON PLATEAU	7750	12/27	26	5.3	-	9.6
MADISON PLATEAU PILLOW	7750	12/27	SP	6.4	9.6	10.1
MANY GLACIER	4960	12/29	25	7.8	6.5	-
MANY GLACIER PILLOW	4960	12/29	SP	7.1	7.2	-
MARIAS PASS	5250	12/28	17	5.0	8.6	6.6
MAYNARD CREEK	6210	12/27	9	1.7	10.9	6.4
MAYNARD CREEK PILLOW	6210	12/27	SP	2.0	8.0	5.3
MOOSE CREEK (ID)	6200	12/31	17	3.2	6.6	6.9
MOULTON RESERVOIR	6850	12/26	10	1.5	4.4	-
MOUNT LOCKHART	6400	12/31	27	7.8	10.6	9.7
MOUNT LOCKHART PILLOW	6400	12/31	SP	4.9	11.2	9.6
NEWTON MOUNTAIN	5600	12/26	47	14.5	8.2	-
NOISY BASIN	6040	12/28	48	14.2	15.2	16.6
NOISY BASIN PILLOW	6040	12/28	SP	11.9	13.7	17.7
NOISY CREEK	3600	12/26	2	.3	-	2.6
NORRIS BASIN (WY)	7500	1/02	15	2.0	-	5.0
NORTH FK. ELK CREEK	6250	12/27	14	3.0	7.5	5.1
NORTH FK. ELK CREEK PILL	6250	12/27	SP	3.0	6.9	5.3
NORTH FORK JOCKO	6330	12/26	51	14.5	17.7	-
NORTHEAST ENTRANCE	7400	12/30	10	1.9	5.3	3.7
NORTHEAST ENTRANCE PILL.	7400	12/30	SP	2.0	5.1	4.3
OLD FAITHFUL(WY)	7360	12/30	16	2.7	-	-
OPHIR PARK	7150	12/30	14	3.0	10.1	8.8
PETERSON MEADOWS	7200	12/26	12	2.0	4.3	4.9
PETERSON MEADOWS PILLOW	7200	12/26	SP	2.1	3.9	5.1
PICKFOOT CREEK PILLOW	6650	12/31	SP	1.2	5.9	-
PIPESTONE PASS	7200	12/31	0	.0	2.9	2.4
POORMAN CREEK	5100	12/26	34	10.4	-	15.9
POORMAN CREEK PILLOW	5100	1/01	SP	8.7	12.8	12.9
PORCUPINE PILLOW	6500	12/31	SP	.8	4.0	-
RED TOP	5260	12/28	35	9.2	6.8	-
ROCKER PEAK	8000	12/27	14	3.1	7.0	7.9
ROCKER PEAK PILLOW	8000	12/27	SP	3.2	7.8	7.3
ROCKY BOY	4700	12/28	0	.0	4.2	1.7
ROCKY BOY PILLOW	4700	12/28	SP	1.3	5.1	1.8
SADDLE MOUNTAIN	7940	12/26	29	6.4	10.5	11.1
SADDLE MOUNTAIN PILLOW	7940	12/26	SP	7.1	10.3	12.3
SAWTELL MOUNTAIN (ID)	8710	1/02	39	10.6	8.5	14.1
SHOWER FALLS	8100	12/31	30	7.5	11.7	11.9
SHOWER FALLS PILLOW	8100	12/31	SP	7.5	10.4	11.8
SILVER RUN PILLOW	6630	12/31	SP	2.0	1.0	-
SKALKAHO SUMMIT	7260	12/27	28	6.6	11.8	-
SKALKAHO SUMMIT PILLOW	7260	12/27	SP	6.7	11.2	-
SPOTTED BEAR MOUNTAIN	7000	12/30	14	3.0	7.6	6.9
SPUR PARK	8000	12/26	20	4.8	10.7	9.8
SPUR PARK PILLOW	8100	12/26	SP	6.0	12.1	10.7
STAHL PEAK	6050	12/26	57	16.7	12.9	23.4
STAHL PEAK PILLOW	6050	12/26	SP	15.0	11.2	10.2
STORM LAKE	7760	12/26	14	2.2	5.2	5.6
STUART MOUNTAIN	7400	1/02	41	11.5	-	13.4
SUCKER CREEK	3960	12/28	0	.0	1.6	.3
SYLVAN PASS (WY)	7100	1/02	18	3.8	6.8	5.9
TARGHEE PASS (ID)	7000	1/02	18	2.7	4.3	6.2
TAYLOR ROAD	4080	12/28	0	.0	5.2	1.9
TEN MILE LOWER	6600	12/27	9	1.6	5.6	2.8
TEN MILE MIDDLE	6800	12/27	15	2.7	6.0	4.6
TEN MILE UPPER	8000	12/27	15	2.6	6.7	5.6
TEPEE CREEK	8000	12/26	22	4.4	5.0	6.6
TEPEE CREEK PILLOW	8000	12/26	SP	4.2	5.0	6.3
THUMB DIVIDE (WY)	7900	12/31	25	3.8	8.2	8.6
TRINKUS LAKE	6100	12/30	43	12.4	16.2	-
TV MOUNTAIN	6800	12/28	22	5.9	8.9	7.4
TWELVEMILE CREEK	5600	12/26	26	5.6	12.8	8.4
TWELVEMILE CREEK PILLOW	5600	12/29	SP	4.5	8.9	7.4
TWENTY-ONE MILE	7150	12/27	19	3.6	6.3	7.8
TWIN CREEKS	3580	12/29	10	2.0A	6.0	5.2
TWIN LAKES	6510	12/28	45	12.5	19.9	17.9
TWIN LAKES PILLOW	6400	12/28	SP	11.9	18.0	17.9
UPPER HOLLAND LAKE	6200	1/02	41	10.8	14.4	-
VALLEY VIEW (ID)	6500	1/02	18	2.8	5.0	6.4
WALDRON	5600	12/31	8	2.1	6.6	3.7
WALDRON PILLOW	5600	12/31	SP	3.4	5.9	4.8
WARM SPRINGS	8250	12/27	22	4.7	9.0	-
WEASEL DIVIDE	5450	12/26	46	13.0	8.6	-
WEST YELLOWSTONE	6700	12/27	17	2.6	4.8	5.1
WEST YELLOWSTONE PILLOW	6700	12/27	SP	1.9	4.4	4.1
WHISKEY CREEK	6800	12/26	25	4.0	8.9	8.6
WHISKEY CREEK PILLOW	6800	12/26	SP	3.9	7.5	7.7
WHITE ELEPHANT (ID)	7700	1/02	28	6.3	6.6	8.9
WHITE MILL	8700	12/31	EST	7.0	14.2	13.8
WHITE MILL PILLOW	8700	12/31	SP	5.1	11.4	12.1
WILLOW CREEK	6500	12/31	16	3.0	6.2	3.9

SATELLITE SNOW COVER

DATA PROVIDED BY NOAA/NESS

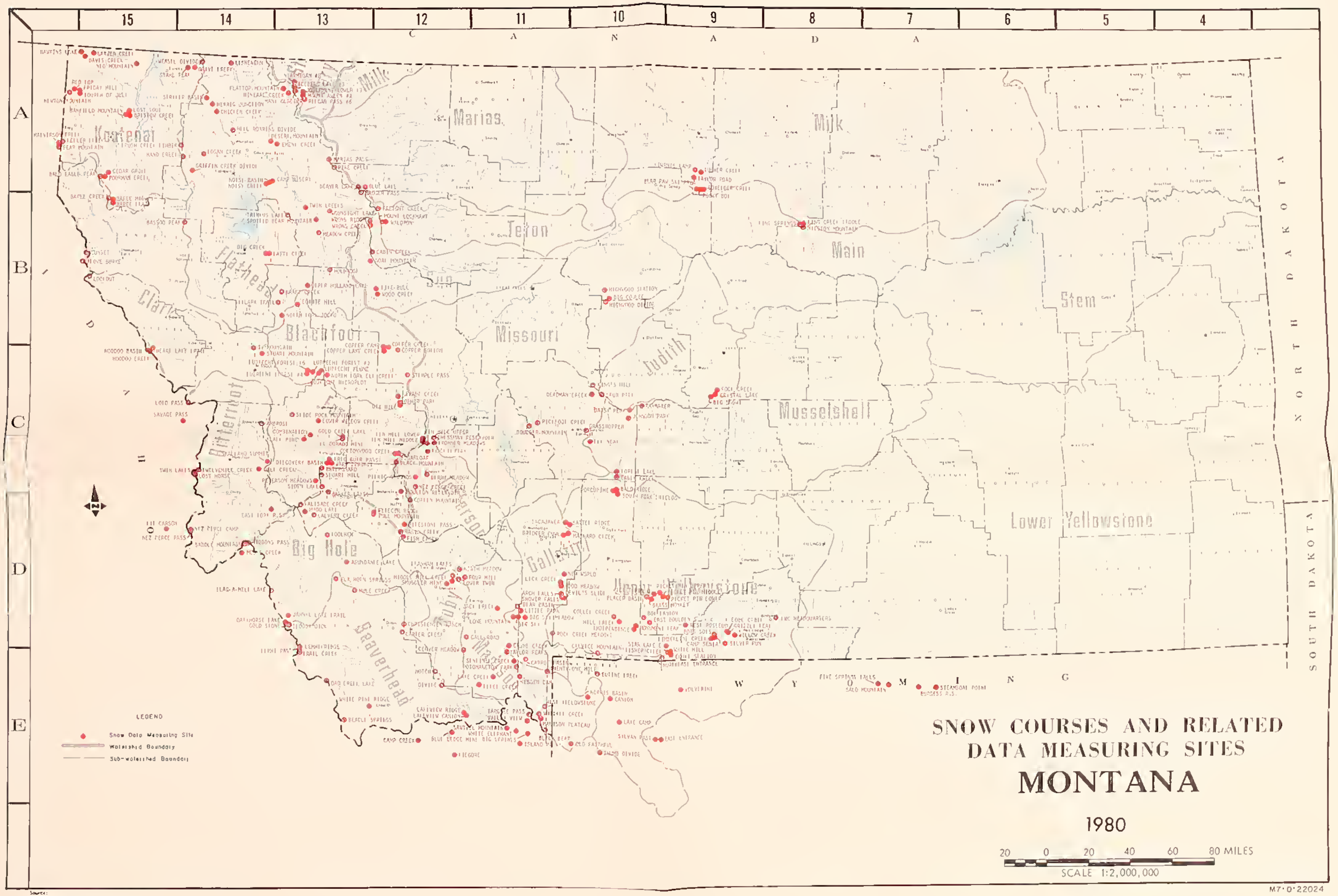


MOST CURRENT DATA
December 30, 1979 72%

MISSOURI RIVER BASIN

Above
Canyon Ferry Dam

DATE	PERCENT SNOW COVER	AVERAGE SNOWLINE ELEVATION IN FEET
November 6, 1979	45	6830
November 12, 1979	45	6830
November 20, 1979	84	5120
November 29, 1979	89	4830
December 11, 1979	80	5340
December 18, 1979	60^{E}	6250
December 23, 1979	88	4890
December 30, 1979	72	5720



SNOW COURSES AND RELATED DATA MEASURING SITES

MONTANA

1980

Source:
Base map prepared by SCS, WTSC Carto Unit from USGS 1:1,000,000 Nat. Atlas.
Thematic detail compiled by state staff.
US DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

INDEX TO MONTANA SNOW COURSES AND DATA SITES

Snow Course	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Drainage Basin
Abundance Lake	8900	7	1S	11W		Big Hole
Ambrose	6430	18	9N	18W		Bitterroot
Arch Falls	7150	3	5S	6E		Gallatin
*Badger Pass	6900	4	27N	11W	A,P,S,T	Teton-Marias-Sun
Bald Eagle Peak	5100	6	21N	31W		Kootenai
Bald Ridge	7500	11	4N	10E		Upper Yellowstone
Banfield Mountain	5600	4	12N	30W	S,P,T,W	Kootenai
Baree Creek	5500	16	26N	11W		Kootenai
Baree Midway	4600	11	26N	10W		Kootenai
Baree Trail	3300	5	15N	30W		Kootenai
*Barker Lakes	8150	11	4N	11W	S,P,T	Clark Fork
†Basin Creek	7180	11	1S	7W	P	Clark Fork
Bassoo Peak	5150	11	24N	25W		Flathead
Battle Ridge	6020	12	2N	1E		Upper Yellowstone
*Beagle Springs	8850	6	16S	11W	S,P,T	Beaverhead
Bear Basin	8150	9	6S	1E		Gallatin
Bear Paw Ski Area	5200	21	28N	16E	P	Milk
Beaver Lake	5900	31	28N	11W		Flathead
Berry Meadow	7000	8	5N	5W		Jefferson
Big Coulee	5100	10	19N	9E		Missouri Main Stem
Big Creek	6150	2	22N	18W		Flathead
Big Sky	7100	10	6S	3E	P	Gallatin
Big Sky Meadow	6350	15	6S	1E		Gallatin
Big Snowy	7150	25	12N	11E		Judith
†Black Bear	7950	27	15S	5E	S,P,T	Madison
Black Mountain	7150	14	7N	8W		Clark Fork
*Black Pine	7100	16	8N	15W	S,P,T	Clark Fork
*Bloody Dick	7600	17	8S	16W	S,P,T	Beaverhead
Blue Lake	5900	25	28N	11W	A	Teton-Marias-Sun
Borr Solr	7150	15	7S	18E		Upper Yellowstone
*Boulder Mountain	7950	1	9N	1E	S,P,T	Missouri Main Stem
*Box Canyon	6700	28	6S	12E	S,P,T	Upper Yellowstone
Boxelder Creek	5100	14	18N	16E	P	Milk
Branham Lakes	8850	5	4S	3W		Ruby
Brarr Monkry	9050	6	5S	14E	P,NSC	Upper Yellowstone
Bridger Bowl	7150	25	1N	6E	S,P	Gallatin
Bristow Creek	7900	2	12N	10W		Kootenai
Brush Creek Timber	5000	12	10N	26W		Kootenai
Bull Mountain	6600	18	2N	5W		Big Hole
Cabin Creek	5200	14	13N	10W		Teton-Marias-Sun
Lall Road	8050	21	8S	2W		Madison
*Calvert Creek	6430	14	2N	14W	S,P,T	Big Hole
Camp Misery	6400	10	28N	16W		Flathead
Camp Senia	7890	2	8S	18E		Upper Yellowstone
Carrot Basin	9000	18	10S	4E	S	Gallatin
Cattrt Creek	7400	22	8S	7W		Beaverhead
†Carhr Creek	7800	8	9S	3E	S,P,T	Gallatin
Cedar Grove	7260	15	28N	11W		Kootenai
Chessman Reservoir	6200	2	9N	5W		Missouri Main Stem
Chicken Creek	4060	14	11N	23W	P	Flathead
Christensen Ranch	6000	14	1S	7W	P,NSC	Beaverhead
*Clover Meadow	8600	28	9S	2W	P,S,T	Ruby
*Cole Creek	7850	16	1S	19E	S,P,T	Upper Yellowstone
Colley Creek	6100	34	6S	10E	P	Upper Yellowstone
*Combination	5600	1	8N	14W	S,P,T	Clark Fork
Cooke Station	8150	19	9S	15E		Upper Yellowstone
*Copper Bottom	5200	15	15N	8W	S,P,T	Clark Fork
*Copper Camp	6950	3	15N	9W	S,P,T	Clark Fork
Copper Creek	5700	1	15N	9W		Clark Fork
Copper Lake Creek	6100	3	15N	9W		Clark Fork
Copper Mountain	7700	13	1N	7W		Jefferson
Cottonwood Creek	6400	14	1N	8W		Clark Fork
Coyote Hill	4200	17	19N	16W		Clark Fork
Crevice Mountain	8400	22	9S	9E		Upper Yellowstone
*Crystal Lake	6100	19	11N	18E	P,S,T	Judith
Dad Creek Lake	8400	24	11S	11W		Beaverhead
Daisy Peak	7600	14	11N	11E	P	Musselshell
*Daly Creek	5780	16	5N	18W	P,T,T	Bitterroot
†Darkhorse Lake	8600	4	8S	16W	P	Big Hole
Davis Creek	5400	20	11N	11W		Kootenai
*Deadman Creek	6450	23	11N	8E	S,P,T	Missouri Main Stem
Desert Mountain	5600	30	11N	18W		Flathead
Devil's Slide	8100	14	5S	6E		Gallatin
Discovery Basin	7050	11	6N	11W		Clark Fork
*Divide	7800	14	12S	4W	S,P,T	Ruby
Dix Hill	6400	14	11N	8W	P	Clark Fork
Eagle Creek	7000	2	5N	10E		Musselshell
East Boulder S	9150	14	1S	12E	A	Gallatin
East Fork R. S.	5400	16	2N	17W		Bitterroot
El Dorado Mine	7500	23	8N	12W		Clark Fork
Elk Horn Springs	7800	21	4S	11W		Beaverhead
Elk Peak	8000	10	8N	8E		Missouri Main Stem
†Emery Creek	4350	20	31N	18W	S,P,T	Flathead
Fatty Creek	5500	8	22N	18W		Flathead
Fish Creek	8000	5	1S	7W		Jefferson
†Fisher Creek	9100	11	9S	14E	S,P,T	Upper Yellowstone
Ilue-Bull	5700	25	20N	10W		Teton-Marias-Sun
*Flattop Mountain	6100	12	35N	18W	S,P,T	Flathead
Fleecer Ridge	7500	1	1N	10W		Big Hole
Fool Hen	8280	11	1S	13W		Big Hole
Forest Lake	6400	26	6N	10E		Musselshell
Four Mile	6900	5	4S	2W	P	Madison
Fourth of July	7450	19	34N	11W		Kootenai
Fred Burr Pass	8000	12	6N	13W		Clark Fork
Freight Creek	6000	13	26N	10W		Teton-Marias-Sun
Friday Hill	4610	19	14N	13W		Kootenai
*Frohner Meadow	6480	21	8N	5W	T,P,T	Missouri Main Stem
Garver Creek	4250	18	11N	12W	S,P,T,W	Kootenai
Gibbons Pass	7100	1	2S	19W		Bitterroot
Coal Mountain	7000	20	11N	10W		Teton-Marias-Sun

Snow Course	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Drainage Basin
Gold Creek Lake	2200	14	8N	12W		Clark Fork
Gold Stone	8100	11	8S	16W		Beaverhead
Grasshopper	7000	19	9N	8E		Missouri Main Stem
*Graves Creek	4100	1	16N	15W	S,P,T	Kootenai
Griffin Creek Divide	5150	11	28N	25W		Flathead
Grizzly Peak	8400	26	1S	13E		Upper Yellowstone
Gunsight Lake	6100	30	26N	11W		Flathead
*Hand Creek	5015	6	29N	19W	T,P,T	Flathead
Hawkins Lake	6450	18	17N	11W	T,P,T,W	Kootenai
Hermosa	8050	16	11N	12E		Musselshell
Heart Lake Trail	4800	11	14N	27W		Clark Fork
Hebgen Dam	6550	22	11S	3E		Madison
Hell Roaring Divide	5770	35	31N	22W		Flathead
Herrig Junction	4850	19	14N	23W	P	Flathead
Highwood Divide	5650	16	19N	9E	P	Missouri Main Stem
Highwood Station	4600	20	20N	9E	P	Missouri Main Stem
Holbrook	4510	18	21N	17W	A	Flathead
Hood Meadow	5600	12	4S	6E		Gallatin
Hoodoo Basin	6000	11	14N	27W	S,P,T	Clark Fork
Hoodoo Creek	5900	16	14N	17W		Clark Fork
Iceberg Lake #3	5600	1	35N	17W		St. Mary
Independence	7850	21	1S	13E		Upper Yellowstone
Intergaard	6450	6	5N	13W		Clark Fork
Jack Creek	6650	1	6S	1E		Madison
Johnson Lake Trail	7200	24	7S	16W		Big Hole
Johnson Park	6450	16	10N	11E		Musselshell
Josephine Lower #9	4900	32	35N	16W		St. Mary
Iralnr Creek	7100	15	10N	35W		Kootenai
King Creek Saddle	4550	10	25N	14E		Milk
King Springs	4150	9	25N	21E		Milk
King's Hill	7500	14	11N	8E		Missouri Main Stem
Kishenehn	3090	14	12N	22W		Flathead
Kiwanis Camp	7720	9	29N	16E	P,T,W	Milk
*Kraft Creek	4250	4	19N	17W	T,P,T	Flathead
Lake Creek	6100	21	11S	1E		Madison
Lakeview Canyon	6910	26	14S	2W		Beaverhead
*Lakeview Ridge	7400	22	14S	2W	P,S,T	Beaverhead
Lemhi Pass	7490	9	10S	15W		Beaverhead
*Lemhi Ridge	8100	4	10S	15W	T,P,T	Beaverhead
*Lick Creek	6860	10	4S	6E	T,P,T	Gallatin
Little Park	2400	32	6S	1E		Gallatin
Logan Creek	4100	34	30N	24W		Flathead
Lone Mountain	8880	15	6S	2E		Gallatin
Lost Horse	5940	5	4N	21W		Bitterroot
Lost Soul	4800	11	33N	29W		Kootenai
*Lower Twin	7900	12	4S	3W	P,S,T	Madison
Lower Willow Creek	4740	3	[illegible]	14W	P,NSC	Clark Fork
*Lubrecht Flume	4680	13	13N	14W	S,P,T	Clark Fork
Lubrecht Forest #3	5450	19	13N	14W		Clark Fork
Lubrecht Forest #4	4650	21	13N	15W		Clark Fork
Lubrecht Forest #6	4040	11	13N	15W		Clark Fork
Lubrecht Hydroplot	4200	32	13N	14W		Clark Fork
Madison Plateau	7750	28	14S	5E	S,P	Madison
*Many Glacier	4960	10	15N	17W	T,P,T	St. Mary
Marias Pass	5250	11	30N	13W		Teton-Marias-Sun
Maynard Creek	6210	19	1N	2E	S,P	Gallatin
Meadow Creek	4000	11	24N	14W	S,NSC	Flathead
Middle Mill Creek	7850	11	4S	3W		Ruby
Mill Creek	7500	11	6S	11E	P	Upper Yellowstone
Mineral Creek	4000	16	35N	17W		Flathead
Mirrlar Mountain	5050	15	25N	24E	P	Milk
*Monument Peak	8800	16	1S	12E	S,P,T	Upper Yellowstone
Moulton Reservoir	6850	11	4N	7W		Clark Fork
Mount Allen #7	5100	21	35N	16W		St. Mary
*Mount Lockhart	6400	18	15N	9W	S,P,T	Teton-Marias-Sun
Mud Lake	7650	24	1N	15W		Big Hole
†Mule Creek	8100	9	5S	11W	S,P,T	Big Hole
*Nevada Ridge	6480	6	12N	7W	T,P,T	Clark Fork
New World	6100	24	3S	6E		Gallatin
Newton Mountain	5600	23	34N	14W		Kootenai
*Nez Perce Camp	5580	19	1S	11W	S,P,T	Bitterroot
Nez Perce Creek	6500	16	4N	6W		Jefferson
Nez Perce Pass	6510	25	1S	24W		Bitterroot
*Noisy Basin	6040	25	28N	19W	S,P,T	Flathead
Noisy Creek	3600	35	28N	15W		Flathead
*North Fork Elk Creek	6250	10	13N	13W	S,P,T	Clark Fork
North Fork Jocko	6130	3	11N	17W		Flathead
North Meadow	7500	24	3S	3W		Madison
*Northeast Entrance	7400	11	9S	14E	T,P,T	Upper Yellowstone
Notch	8500	18	11S	4W		Ruby
Ophir Park	7150	13	11N	8W		Clark Fork
Palisade Creek	8250	1	2N	15W		Big Hole
Peterson Meadows	7200	2	4N	14W	S,P	Clark Fork
Picket Pin D	9450	36	4S	13E	A	Upper Yellowstone
Picket Pin Lower	6400	1	5S	14E	P	Upper Yellowstone
Picket Pin Middle	7250	1	5S	14E		Upper Yellowstone
Picket Pin Upper	8100	32	4S	14E	P	Upper Yellowstone
†Pickfoot Creek	6650	31	10N	4E	S,P,T	Missouri Main Stem
Picnic Grounds	6500	21	5N	6W		Jefferson
Plrgrn Pass #6	5500	21	15N	16W		St. Mary
*Pike Creek	5910	5	29N	11W	S,P,T	Teton-Marias-Sun
Pipestone Pass	7200	10	1N	7W		Jefferson
*Placer Basin	8810	11	5S	13E	A	Upper Yellowstone
FMC Headquarters	7656	14	6S	21E	P,W,T,NSC	Upper Yellowstone
Poorman Creek	5100	5	27N	31W	S,P,T,W	Kootenai
*Porcupine	6500	10	4N	10E	S,P,T	Upper Yellowstone
Potomageton Park	7150	31	10S	1E		Madison
Pinrolgrn #8	5800	16	16N	17W		St. Mary
Red Mountain	6000	4	16N	29W		Kootenai
Red Top	5260	14	14N	34W		Kootenai

Snow Course	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Drainage Basin
Rock Creek	5600	1	12N	18E		Judith
Rock Creek Meadows	8160	14	1S	5E	T	Gallatin
*Rocker Peak	8000	11	7N	5W	T,P,T	Jefferson
Rocky Boy	4100	12	28N	16E	S,P	Milk
Sacajawea	6550	36	2N	6E		Upper Yellowstone
*Saddle Mountain	2940	5	2S	15W	S,P,T	Bitterroot
Sentinel Creek	8100	11	10S	1E		Madison
*Shower Falls	8100	14	5S	6E	S,P,T	Gallatin
*Silver Run	6630	11	8S	19E	T,P,T	Upper Yellowstone
*Skalkaho Summit	7260	10	6N	17W	P,T	Clark Fork
*Skylark Trail	6200	29	19N	17W	T,P,T	Flathead
Slag-A-Melt Lake	8150	29	5S	17W		Big Hole
Slide Rock Mountain	7100	15	10N	16W		Clark Fork
Smuggler Mine	6960	24	4S	4W		Ruby
†South Fork Shields	8100	11	4N	10E		Upper Yellowstone
Spotted Bear Mountain	7000	23	25N	15W	A	Flathead
†Spur Park	8100	10	12N	9E	S,P,T	Judith
*Stahl Peak	6030	5	16N	25W	T,P,T	Kootenai
Star Lake E	5650	11	8S	15E	A	Upper Yellowstone
Steeple Peak	6600	16	13N	7W		Missouri Main Stem
Storm Lake	7780	19	4N	13W		Clark Fork
Stryker Basin	6180	16	34N	24W	P	Flathead
Stuart Hill	6500	19	5N	13W		Clark Fork
Stuart Mountain	7400	6	14N	18W		Clark Fork
Sucker Creek	3760	11	19N	16E	P	Milk
Sugarloaf	7150	11	7N	8W		Clark Fork
Taylor Peaks	8500	26	5S	1E	T,P	Gallatin
Taylor Road	4080	19	19N	16E	P	Milk
Ten Mile Lower	6600	12	8N	6W		Missouri Main Stem
Ten Mile Middle	6800	11	8N	6W		Missouri Main Stem
Ten Mile Upper	8000	19	8N	5W		Missouri Main Stem
*Tepee Creek	8000	15	12S	1W	T,P,T	Madison
Timberline Creek	8850	10	8S	18E		Upper Yellowstone
Trail Creek	7090	15	10S	15W		Beaverhead
Trinkus Lake	6100	9	15N	17W		Flathead
TV Mountain	6800	31	15N	19W		Clark Fork
*Twelvemile Creek	5600	34	5N	23W	S,P,T	Bitterroot
Twenty-One Mile	7150	1	11S	5E		Gallatin
Twin Creeks	7580	25	26N	16W	A	Flathead
*Twin Lakes	6510	12	5N	21W	S,P,T	Bitterroot
Upper Holland Lake	6200	28	20N	15W		Flathead
*Waldron	5600	11	25N	9W	S,P,T	Teton-Marias-Sun
*Warm Springs	7800	13	6N	13W	T,P,T	Clark Fork
Weasel Divide	5450	20	37N	24W		Kootenai
West Rosebud	7500	9	1S	16E		Upper Yellowstone
West Yellowstone	6200	14	13S	5E	S	Madison
*Whiskey Creek	6800	19	14S	1E	S,P,T	Madison
*White Mill	8200	18	9S	15E	S,P,T	Upper Yellowstone
White Pine Ridge	8850	18	14S	9W		Beaverhead
Willow Creek	6500	11	1S	20E		Upper Yellowstone
*Wood Creek	5960	16	20N	10W	S,P,T	Teton-Marias-Sun
Wrong Creek	5200	12	25N	10W		Teton-Marias-Sun
Wrong Ridge	6800	17	25N	10W		Teton-Marias-Sun

WYOMING

Snow Course	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Drainage Basin
*Bald Mountain	9380	19	56N	91W		Big Horn
*Burgess R.S. No. 2	7880	15	56N	89W		Tongue
*Canyon	7940	-	-	-		Upper Yellowstone
East Entrance	6960	17	52N	109W		Big Horn
Five Springs Falls	7620	20	56N	92W		Big Horn
Lake Camp	7780	-	-	-		Upper Yellowstone
Lupine Creek	7380	-	-	-		Upper Yellowstone
Norris Basin	7500	-	-	-		Madison
Old Faithful	7400	27	51N	116W		Madison
Steamboat Point	7560	19	56N	87W		Tongue
Sylvan Pass	7100	-	-	-		Upper Yellowstone
Thumb Divide	7980	-	-	-		Upper Yellowstone
Wolverine	7650	29	55N	106W		Upper Yellowstone

IDAHO

Snow Course	Elev.	Sec.	Twp.	Range	Sensors in Addition to Snow Course 1/	Drainage Basin
†Above Burke	4100	11	48N	5E	S,P	Spokane
Bear Mountain	5400	9	51N	1E		Pend O'Reille
Big Springs	6400	4	13N	44E		Snake
Blue Ledge Mine	6100	21	11N	38E		Snake
Camp Creek	6800	11	13N	36E		Snake
Halverson Creek	4850	3	57N	1E		Kootenai
Island Park	6290	18	13N	43E		Snake
Kilgore	6200	6	11N	39E		Snake
Kit Carson	5020	4	21N	16E		Clearwater
Lolo Pass	5240	16	18N	15E		Clearwater
*Lookout	5120	4	41N	6E	S,P	Spokane
Moose Creek	6200	14	27N	21E		Salmon
Savage Pass	6110	18	16N	15E		Clearwater
Sawtell Mountain	8120	1	14N	43E		Snake
*Sunset	5600	11	49N	5E	A,T,P	Spokane
Targhee Pass	7000	12	16N	44E		Snake
Valley View	6740	7	15N	44E		Snake
White Elephant	7100	17	14N	43E		Snake

LEGEND

* SNOTEL site - data transmitted daily by telemetry

† Proposed SNOTEL site - scheduled for installation in 1980 Water Year.

1/ Blank refers to snow course only at site
S = Snow pillow also
P = Precipitation gage also
T = Max-min temperature also
W = Wind run also
A = Aerial marker also
NSC = no snow course

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET		THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	April - September				April - July			
BEAVERHEAD RIVER near Grant (1)	76.0	44	102	171	70.0	47	93.4	148
RUBY RIVER near Alder	65.0	62		105	52.0	58		89.0
BIG HOLE RIVER near Melrose	340	43		792	315	43		730
MADISON RIVER near Grayling (2)	387	74	382	519	300	73	296	409
MADISON RIVER near McAllister (3)	664	74	641	892	532	75	512	706
GALLATIN RIVER near Gateway	384	67		572	329	67		488
GALLATIN RIVER at Logan	330	51		649	277	50		557
MISSOURI RIVER at Toston (6)	1,391	52	1,980	2,672	1,190	51	1,718	2,330
SUN RIVER at Gibson Dam (7)	400	69	471	578	360	68	428	529
MISSOURI RIVER at Fort Benton (8)	1,990	48		4,148	1,700	47		3,640
MARIAS RIVER near Shelby	405	70	468	577	360	68	443	532
MISSOURI RIVER at Virgelle (10)	2,390	50		4,794	2,070	49		4,238
MISSOURI RIVER near Landusky (10)	2,611	50		5,215	2,250	49		4,586
MISSOURI RIVER below Fort Peck Dam (11)	2,438	49		4,929	2,100	48		4,381
MISSOURI RIVER near Williston, North Dakota (13)	7,397	55		13,522	6,400	54		11,864
SASKATCHEWAN RIVER BASIN								
ST. MARY'S RIVER near Babb (14)	415	83		455	354	83		426

All forecasts prepared in cooperation with National Weather Service

(1) Adjusted for storage in Lima and Clark Canyon Reservoirs.
(2) Adjusted for storage in Hebgen Lake.
(3) Adjusted for storage in Hebgen Lake and Ennis Lake.
(6) Adjusted for storage in Lima, Hebgen, Ennis & Clark Canyon Reservoirs.
(7) Adjusted for storage in Gibson Reservoir & diversions.
(8) Adjusted for storage in Lima, Clark Canyon, Hebgen, Ennis, Gibson, Pishkun, Willow Creek & Canyon Ferry Reservoirs.
(10) Adjusted for Lima, Clark Canyon, Hebgen, Ennis, Gibson, Pishkun, Willow Creek, Canyon Ferry, Elwell (Tiber) Reservoirs.
(11) Adjusted for Ft. Peck in addition to those shown in (10).
(12) Adjusted for storage in Canyon Ferry, Elwell (Tiber) and Ft. Peck Reservoirs.
(13) Sum Yellowstone River near Sidney & Missouri River near Culbertson.
(14) Adjusted for storage in Lake Sherburne.

SUMMARY of SNOW MEASUREMENTS
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average †
Beaverhead	8	88	63
Ruby	1	88	67
Big Hole	7	46	48
Boulder	7	30	42
Jefferson	23	56	54
Madison	11	64	55
Gallatin	11	62	60
Missouri Headwater	45	60	56
West-side Missouri (Toston-Cascade)	6	32	46
Smith & Belt	3	43	46
Missouri Main-stem	9	37	46
Teton & Sun	2	58	74
Marias	3	67	66
Marias-Teton-Sun	5	64	68
Judith	3	43	46
Musselshell	-	-	-
Judith-Musselshell	3	43	46
Milk	7	25	55
Bear Paws	6	16	43
Missouri (Total)	68	54	56
Saskatchewan			
St. Mary's	1	58	76
Bow River in Alberta	-	-	-

MOUNTAIN SNOWPACK

Dry soils and below average snowpack exists over this entire drainage. The area roughly south of Great Falls and north of Bozeman has a snowpack that is only 30 to 50 percent of average. Most of the Missouri River headwaters and the Sun River drainage have between 50 and 70 percent average snow cover. The area north of the Teton River to the Canadian border shows the best snowpack where snow water content is near 80 percent of average.

WATER SUPPLY OUTLOOK
Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply.

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Beaverhead	fair	poor
Ruby	fair	poor
Big Hole	fair	poor
Boulder	fair	poor
Jefferson	fair	poor
Madison	fair	fair
Gallatin	fair	fair
West-Side Missouri	fair	poor
Smith-Belt	fair	poor
Sun	fair	fair
Teton	fair	fair
Marias	fair	fair
Judith	fair	poor
Musselshell	fair	poor
Milk	fair	fair
Bear Paws	fair	fair
St. Mary's	fair	fair

STREAMFLOW FORECASTS

Based on current snowpack and soil moisture conditions, spring and summer streamflow in the Missouri River system will be about one-half average. The Madison and Marias Rivers should be slightly higher and near 75 percent of average. The St. Mary's River, with most of its headwaters in Glacier National Park, is expected to produce runoff 15 percent below average.

There is still a significant portion of the snow accumulation period left. However, if present weather patterns continue, there could be widespread shortages of irrigation water supplies over most of the basin. Forecasts have been prepared only for the major streams in the basin. February 1, forecasts will be issued for all points.

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET		THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	April - September				April - July			
YELLOWSTONE RIVER at Corwin Springs	1,450	69	1,809	2,102	1,210	69	1,555	1,688
YELLOWSTONE RIVER near Livingston	1,700	69		2,471	1,400	68		2,048
BOULDER RIVER at Big Timber	286	69		416	265	69		382
STILLWATER near Absarokee (1)	480	73		660	398	72		555
CLARKS FORK RIVER near Belfry	455	71		608	400	71		541
YELLOWSTONE RIVER at Billings	3,039	65	3,882	4,682	2,550	64	3,647	3,979
BIGHORN RIVER near St. Xavier (3)	1,375	68	1,295	2,034	1,260	68	1,143	1,861
YELLOWSTONE RIVER at Miles City (4)	4,554	64		7,142	3,930	63		6,243
YELLOWSTONE RIVER near Sidney (5)	5,386	69		7,807	4,600	68		6,805

(1) Adjusted for storage in Mystic Lake
(2) Adjusted for storage in Cooney Reservoir
(3) Adjusted for storage in Buffalo Bill, Boysen, Bull Lake, Pilot Butte and Bighorn Reservoirs
(4) Adjusted for storage in Bull Lake, Buffalo Bill, Boysen, Pilot Butte, Bighorn and Tongue River Reservoirs.
(5) Adjusted for reservoirs shown in (4) and diversions into the Lower Yellowstone Canal.

All forecasts prepared in cooperation with National Weather Service

SUMMARY of SNOW MEASUREMENTS
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average †
Upper Yellowstone ab Livingston	8	50	55
Shields	2	25	33
Boulder & Stillwater	-	-	-
Rock Creek & Clark's Fork	6	52	63
Yellowstone (above Bighorn River)	16	47	55
Bighorn/Wyoming	-	-	-
Little Bighorn	-	-	-
Bighorn (Total)	-	-	-
Tongue	-	-	-
Powder	-	-	-
Yellowstone (Total)	16	47	55

MOUNTAIN SNOWPACK

The headwaters in Yellowstone Park and in the Bridger and Crazy Mountains show much below average snow cover. Many snow courses in this area show 40 to 50 percent of their average snowpack. Portions of the Beartooth Mountains show the best snow conditions in the Yellowstone area, but still report snow water contents 25 percent below average. Most of the remaining areas show a snowpack between 50 and 70 percent.

Soils under the snow are reported to be drier than usual.

WATER SUPPLY OUTLOOK
Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Yellowstone at Livingston	fair	poor
Shields	fair	poor
Boulder	fair	poor
Sweetgrass - Big Timber	fair	poor
Stillwater	fair	poor
Rock Creek	fair	poor
Clark's Fork	fair	poor
Yellowstone above Bighorn	fair	poor
Bighorn	fair	fair
Little Bighorn	fair	fair
Tongue	fair	fair
Powder	fair	fair
Lower Yellowstone	fair	poor

STREAMFLOW FORECASTS

Streamflow Forecasts - Yellowstone

Estimates of spring and summer runoff, based on current snowpack and soil moisture conditions, are in the 65 to 75 percent of average range. If present weather patterns continue, shortages of irrigation water supplies can be expected. The severity of shortages will depend largely on snowfall during the next two to three months. Forecasts have been prepared for only the larger streams in the drainage. February 1, forecasts will be issued for all points.

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET		THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET		THIS YEAR FORECAST		PAST RECORD THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average	Thousand Acre Feet	Percent of Average	Last Year	Average
PERIOD	April - September				April - July				April - June			
COLUMBIA												
KOOTENAI RIVER below Libby Dam	6,630	91	4,459	7,279	5,560	90	3,853	6,219				
KOOTENAI RIVER at Leonia (1)	7,820	88	5,606	8,883	6,700	87	4,908	7,727	5,340	87	4,113	6,150
BLACKFOOT CREEK near Bonner	660	65		1,017	590	64		920	510	64		794
CLARK FORK RIVER above Milltown (6)	520	62		843	445	61		730	375	61		613
CLARK FORK RIVER above Missoula	1,180	63	1,434	1,859	1,035	63	1,284	1,651	885	63	1,153	1,408
BITTERROOT RIVER near Darby	380	63		602	340	62	385	552	300	62	346	480
BITTERROOT RIVER at Missoula (9)	990	64		1,543	900	63		1,416	765	63		1,211
CLARK FORK RIVER below Missoula	2,170	64		3,405	1,935	63		3,069	1,650	63		2,618
CLARK FORK RIVER at St. Regis	2,950	65	3,607	4,521	2,660	65	3,296	4,078	2,235	64	2,970	3,492
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,470	75		1,969	1,320	74		1,782	1,100	74		1,498
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,410	74	1,709	1,911	1,300	74	1,591	1,750	1,070	73	1,405	1,470
SOUTH FORK FLATHEAD RIVER near Columbia Falls	1,725	75	2,020	2,302	1,600	74	1,933	2,159	1,400	74	1,775	1,884
FLATHEAD RIVER at Columbia Falls (10)	4,680	74	5,271	6,330	4,310	74	4,948	5,827	3,720	75	4,460	4,964
FLATHEAD RIVER near Polson (11)	5,450	74	6,186	7,394	5,010	74	5,803	6,806	4,300	74	5,188	5,779
CLARK FORK RIVER near Plains (11)	8,590	70	10,150	12,340	7,810	70	9,441	11,222	6,560	69	8,483	9,507
CLARK FORK RIVER at Whitehorse Rapids	9,480	69		13,781	8,610	69		12,519	7,250	68		10,633

All forecasts prepared in cooperation with National Weather Service

(1) Adjusted for storage in Lake Koocanusa.
(6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.
(9) Difference in observed flow Clark Fork above and below Missoula.
(10) Adjusted for storage in Hungry Horse Reservoir.
(11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.

SUMMARY of SNOW MEASUREMENTS

(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	Average +
Kootenai/BC	-	-	-
Kootenai/Montana	-	-	-
Kootenai	-	-	-
Little Bitterroot	-	-	-
Flathead	14	70	64
Clark Fork above Blackfoot	17	32	40
Blackfoot	10	36	51
Clark Fork above Missoula	27	33	43
Bitterroot	9	56	65
Lower Clark Fork below Missoula	6	76	81
Clark Fork (Total w/o Flathead)	42	51	61
Pend O'Reille (Clark Fork & Flathead)	56	56	62
Columbia (Pend O'Reille & Kootenai)	56	56	62

MOUNTAIN SNOWPACK

All areas have below average snowpack and drier than normal soil moisture. The Blackfoot and Clark Fork River headwaters have the lowest snowpack conditions at 30 to 50 percent of average. The southern portion of the Kootenai River, most of the Flathead River and the Bitterroot River headwaters have 50 to 70 percent of average snowpack. The lower Flathead and lower Clark Fork River areas have 70 to 90 percent of average snow cover.

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period	
	Spring Season	Late Season
Tobacco	fair	fair
Little Bitterroot	fair	fair
Mission Valley	fair	fair
Flint Creek	fair	poor
Upper Clark Fork	fair	poor
Nevada Creek	fair	poor
Blackfoot	fair	poor
West-side Bitterroot	fair	fair
East-side Bitterroot	fair	poor
Bitterroot River	fair	poor
Lower Clark Fork	fair	poor

STREAMFLOW FORECASTS

Present snowpack and soil moisture conditions indicate that runoff during the spring and summer months will be well below average in most drainages. The exceptions are the Kootenai River and smaller streams near the Canadian border. Unless there is a significant increase in precipitation over the next two or three months, shortages of irrigation water supplies can be expected. Shortages will be largely determined by snowfall during the rest of the winter. Forecasts have only been prepared for major streams. February 1, forecasts will be issued for *all* points.

AVERAGE MONTHLY WEATHER OUTLOOK

For January, 1980

The National Weather Service (NWS) provides an average monthly weather outlook for North America. Since future weather is significant in water supply forecasts, it is planned to include these NWS forecasts in the Water Supply Outlook.

The NWS estimated temperature for January, 1980, is to be above average in Montana and most of the western states.

PROVIDED BY USDC, NOAA, NWS

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
	COLUMBIA				
Kootenai	Koocanusa	5,694.0	2,881.0	3,292.0	-
Flathead	Hungry Horse	3,428.0	2,055.0	2,478.0	2,624.0
	Flathead Lake	1,791.0	1,122.0	1,151.0	1,428.0
	Camas (4)	45.2	15.2	7.3	19.4
	Mission Valley (8)	100.3	25.0	51.7	34.4
Clark Fork	Georgetown Lake	31.0	28.1	30.7	28.2
	Lower Willow Creek	4.9	1.0	0.3	1.4
	Nevada Creek	12.6	3.0	2.9	4.3
	Noxon Rapids	334.6	326.9	282.2	318.7
Bitterroot	Painted Rocks	31.7	-	19.8	18.3
	Como	34.9	-	-	9.0
	MISSOURI				
Beaverhead	Lima	84.0	11.4	31.0	38.8
	Clark Canyon	257.2	137.2	307.2	132.7
Ruby	Ruby	38.8	-	-	20.4
Madison	Hebgen Lake	377.5	277.0	241.4	241.5
	Ennis Lake	41.0	34.7	33.6	35.6
Gallatin	Middle Creek	8.0	2.8	3.5	2.9
Missouri	Canyon Ferry	2,043.0	1,652.0	1,637.0	1,753.0
	Hauser & Helena	61.9	63.6	63.8	61.2
	Lake Helena	10.4	11.1	10.9	10.2
	Holter Lake	81.9	81.6	75.7	76.2
	Fort Peck Lake	18,910.0	16,470.0	17,364.0	15,820.0
Smith	Smith River	10.6	6.3	10.5	6.4
	Newlan Creek	12.4	-	10.3	-
Musselshell	Bair	7.0	4.7	5.7	4.2
	Martinsdale	23.1	10.6	-	10.0
	Deadman's Basin	72.2	-	-	44.7
Sun	Gibson	99.0	26.8	71.3	38.6
	Willow Creek	32.2	23.2	25.5	20.6
	Pishkun	32.0	18.9	19.7	16.7
Marias	Lower Two Medicine	11.9	-	-	6.1
	Four Horns	19.2	-	-	13.2
	Swift	30.0	10.8	17.7	12.9
	Lake Frances	111.9	62.8	94.5	70.9
Milk	Elwell (Tiber)	1,347.0	544.6	549.6	545.6
	Beaver Creek	3.5		0.7	1.4
	Fresno	127.2	47.4	77.2	68.2
	Nelson	66.8	43.6	47.5	45.0
	HUOSON BAY				
St. Mary's	Lake Sherburne	66.2	15.1	10.9	17.0
	YELLOWSTONE				
Stillwater	Mystic Lake	21.0	12.8	19.8	13.1
Clark's Fork	Cooney	27.4	13.9	14.1	14.2
Tongue	Tongue River	68.0	13.9	35.0	30.4
Bighorn	Bighorn Lake	1,356.0	1,001.0	933.7	580.3

Average based on 1963–77 period.